

Dexter developed the Dexter breed of cattle by crossing the true Kerries on cattle of a beefy sort, possibly Shorthorns? Was the cow called *Red Rose* which produced nearly 10,000 lb. of milk in a year a true Kerry? Is the cow figured on p. 380 as a Dexter-Kerry really a Dexter-Kerry? Is the outcome of the cross of Shorthorn bulls on Galloway cows usually a blue-grey? Did the monks of the Middle Ages have the Cheviot breed of sheep about the pasture-lands of the old monasteries? Did George Washington have Bakewell ewes at Mount Vernon, or is it only "said"? Do black-faced sheep subsist largely on heather?

The answers to some of these questions may be in the affirmative, but they need support before being accepted.

There are two breeds of cattle peculiar to America, viz. the polled Durhams and the polled Herefords, about the origin of which one would like to have definite information. In both these breeds there are what are called "double standards" and "single standards": the "double standard" animals being pure-bred hornless sports and their descendants, and the "single standards," in the case of the Hereford, being animals "not eligible to record in the American Hereford Record," and, in the case of the Shorthorns, animals "got by the use of Shorthorn bulls on the native muley cows." We never hear of hornless sports among pure-bred Herefords or Shorthorns in Britain, and some information as to the circumstances in which these occur in America would be not only interesting, but useful to students of heredity.

JAMES WILSON.

POWER GAS PRODUCTION.

Power Gas Producers, their Design and Application.

By Philip W. Robson. Pp. iv+247. (London: E. Arnold, 1908.) Price 10s. 6d. net.

THE wonderful advance in the production of power made by the suction gas plant combined with the gas engine gives great importance to any trustworthy literature on the subject, and the work on power gas producers by Mr. P. W. Robson is certainly one which will be warmly welcomed, as it sets the subject out in a clear and concise manner, and indicates the theory of the various actions, as well as the means by which the application is carried out.

As the author very fairly admits, it is difficult for one engaged in the manufacture of a particular class of producer to treat thoroughly of the work of other firms, with the result that perhaps full justice has not been done in every case; but as a whole the book is wonderfully free from error, although there are a few points which might be amended.

The statement made on p. 17 that anthracite and gas coke have practically the same proportion of volatile matter is a little loose, as with a good gas coke one does not expect to find more than 1 per cent., whilst the average in anthracite is about 5 per cent. to 6 per cent. On p. 29 the reader is left to infer that, inasmuch as a temperature of 900° C. to

1000° C. favours the formation of carbon monoxide rather than the dioxide, it is the best to employ, whilst practical conditions undoubtedly dictate a lower temperature in order to avoid the tendency to clinker which is so often found with fuels that are not of quite the best quality. Indeed, some of the largest producer makers hold that a temperature between 800° C. and 900° C. is the best for practical working.

In the conclusion to this chapter, also, the statement that an excessive amount of steam lowers the temperature all round and is generally against efficiency, preventing the production of a good gas, is of course modified by the fact that within a fairly wide range increase of carbon dioxide almost invariably means a corresponding increase of hydrogen, and if this were not so it is quite clear that such processes as the Mond would not be possible, whilst the advantage of an excess of steam over the theoretical quantity is in reduction of clinker and ensuring free combustion of that portion of the carbon which otherwise remains in the ash.

In chapter iii. the statement is made that the regulation of the steam is unnecessary, and in producers of the "National" type this may be the case, as it would be very difficult indeed to regulate a water feed which has to distribute over half a dozen places, but with other forms of producer it is certain that if a less saturation of the air is arranged for low loads and is increased in an increasing ratio at full loads, a more uniform temperature is maintained in the generator.

On p. 46 indicator diagrams are shown of the National and Crossley engines as illustrating conclusively that the gas produced with excess of steam could not have been of such high calorific value as that evolved in the National type of producer, but the author has evidently overlooked the fact that in the trial here quoted the National engine was taking full gas, whilst the Crossley engine had the gas charge throttled so as to keep within the limits of power of the trial.

It is stated on p. 71 that the temperature of the gas entering the cooling or coke scrubber should be 600° F., but this temperature would be with ordinary plants far too high, and would be taken as showing that in the form of vapouriser used the heat was not properly extracted.

The author mentions on p. 106 that some French makers have introduced a chemical purifier containing oxide of iron for the purpose of eliminating sulphuretted hydrogen from the gas, but surely it is unnecessary to give credit for what has been done in every gas works for very many years.

On the last line but one of p. 84 "per hour" should be inserted after "7½ gallons," whilst in the table on p. 136 the higher value of the heat efficiency for the whole run should be 80 per cent. instead of 8 per cent., and there is a misprint on the third line from the bottom of p. 221.

The portions of Mr. Robson's work which deal with bituminous gas plants are not nearly so good as those portions that have reference to the use of anthracite and coke, whilst the chapters on work

and management are clearly based on knowledge gained with the National type of producer, and would not in every case be applicable to another form.

The description on p. 56 of the arrangements in the Crossley plant for varying the entering mixture is not very clear, and throughout the book but little is said of the generators produced by this firm, and it is limitations of this kind which are the chief fault that can be urged against an otherwise admirable book.

THE NATIONAL COLLECTION OF FISHES

Guide to the Gallery of Fishes in the Department of Zoology of the British Museum (Natural History), Cromwell Road, London, S.W. Pp. v+209. (London: Printed for the Trustees, 1908.) Price 1s.

THE unique collection described in this guide consists mainly of stuffed specimens, coloured, as far as possible, to resemble the fishes in their natural conditions. "I believe," says the director in the preface, "that there is no other collection of fishes in a public museum in which the specimens are presented without the usual iron supports, with sufficient space around each fish and in natural colours, instead of the oily-brown which all dried fishes tend to acquire." All preserved material is kept in a separate building, where it is accessible only to special applicants. This arrangement is very desirable, since arrays of jars displaying mystifying anatomical details merely serve to distract the general student of fishes who wishes to devote his attention to the external features of as many species as possible, acquiring, at the same time, such information about each as will enable him to understand their natural relationships, their places in the economy of nature, and the special character and variety of fish-life in all its aspects. This is the chief object of the collection, and of the descriptive labels attached to each specimen case. "This guide is a collection of the labels with some additions, arranged systematically so as to show the groups into which fishes are divided, and is illustrated by figures which are to a large extent taken from photographs of the specimens actually seen in the cases."

The variety and interesting character of the information given in this guide is fairly illustrated by the following samples:—

"The Herring, *Clupea harengus*, 255, is found on both European and American sides of the North Atlantic, and is especially abundant in the North Sea and off Norway. It may thus be regarded as a northern and a cold-water fish. The 'Herring' of the North Pacific is of another species, *Clupea pallasii*. The Herring fisheries of the North Sea take place during the spawning season, which reaches its height in June off Shetland, and in November off Lowestoft. The fishing fleets move southwards as the centre of shoaling shifts from point to point. The spawn of the Herring, unlike that of most food fishes, even the allied Pilchard and Sprat, sinks to the bottom; but the fish are mostly caught near the surface in drift-nets, which may be more than a mile in length for each boat. About 8,000,000 cwt. of Herrings, valued at more than 2,000,000*l.*, are annually landed

in Great Britain. The largest Herrings come from Loch Fyne, in Scotland."

"The Sea-brems and Snappers belong to the family Sparidae; they are coast fishes, widely distributed, and mostly carnivorous. The spinous and soft portions of the dorsal fin are continuous and nearly equal in extent; the lower rays of the pectoral fin are branched; the lower pharyngeal bones are separate. The genera of the family are distinguished the one from the other chiefly by the characters of the teeth."

In view of the recent rapid growth of our knowledge and increasing public concern regarding our food-fishes, it is not surprising that special attention has lately been devoted by the keepers of the gallery to these fishes. They are distinguished from other fishes by the letters B.F.F. (British Food Fish), while the descriptive labels attached to each specimen give the latest information (repeated in this guide) concerning its economic importance and value, the principal fishing grounds, means of capture, food, and habits.

Altogether, it may safely be said that a student who conscientiously examines the fish series in the national collection and who assimilates the information contained in this guide will acquire an accurate, vivid, and comprehensive knowledge of the world of fishes, a possession not only valuable in itself, but the best possible foundation for more special studies.

W. W.

THE RESISTANCE AND PROPULSION OF SHIPS.

Hydraulics. In two vols. Vol. ii., The Resistance and Propulsion of Ships. By Prof. Dunkerley. Pp. iv+253. (London: Longmans, Green and Co., 1908.) Price 10s. 6d. net.

THIS is the second volume of a treatise on hydraulics written by the author. Its origin may be traced to his previous service as professor of applied mechanics in the Royal Naval College at Greenwich, where students of naval architecture and marine engineering taking advanced courses receive instruction in the resistance and propulsion of ships. A good text-book on these subjects, bringing information up to date, has been much needed, and this volume (of about 250 pages) will be welcomed. It brings together in a clear and compact form the modern theories of stream-lines and wave-motion, and summarises experimental investigations on resistance and propulsion, thus sparing readers the labour and trouble incidental to personal research in many and scattered publications containing the original papers of Rankine, William Froude, Scott Russell, Cotterill, R. E. Froude, and other authorities. The mathematical parts of the book are well written, and the descriptive sections are interesting; numerous diagrams assist the explanations. Practical applications of scientific methods to the design of steamships and their propellers find a place, although no attempt is made to intrude on the special province of the naval